A Work Project presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

EQUITY RESEARCH – VOLVO AB

MIGUEL LOPES MARTINS

AND

JOÃO NUNES DE CARVALHO

A Project carried out on the Master in Finance Program, under the supervision of:

Professor Filipa Castro

Professor Francisco Martins

Professor Nuno Vasconcellos e Sá

Professor Rosário André

January 3rd, 2020

Abstract:

In this research, the reader will find a detailed description of a valuation performed on the company Volvo AB. The research was executed by two students of Nova School of Business and Economics, in the context of the Master's in Finance thesis. By analyzing the macroeconomic outlook, trends in the industry and the company's competitive positioning, an expectation was developed for the future of the company. The estimated stock price for the company as of 31st December 2020 leads us to the final recommendation, after taking capital gains into account, that investors should hold their position.

Keywords: Volvo AB, Valuation, Equity Research, Investment

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

NOVA SCHOOL OF BUSINESS & ECONOMICS

MASTER IN FINANCE

VOLVO AB

AUTOMOTIVE AND HEAVY MACHINERY

COMPANY REPORT

3 JANUARY 2020

STUDENTS:
JOÃO NUNES DE CARVALHO — 26240@novasbe.pt
MIGUEL LOPES MARTINS — 25907@novasbe.pt

Automotive Industry: A New Paradigm

Driving prosperity through transport solutions

- **Disruptive technological improvements:** Integration of new technologies like automation, electrification, or artificial intelligence will increase energy efficiency and reduce the environmental impact of transport and heavy machinery solutions.
- **Intensifying competition:** In an industry where competition is intensifying, innovation will be essential to secure market share, making research and development expenditure vital. Currently, research and development spending of the Group is placed at SEK 16 billion, and we forecast a SEK 30 billion expenditure by 2028.
- **Strong growth in emerging markets:** Emerging economies are gaining a greater significance, with a forecasted 36% of sales coming from Asia by 2028, compared to 25% in 2018. Volvo Group has a portfolio of brands, like Dongfeng and Volvo-Eicher, which enable it to more easily penetrate the Asian markets, where the company secured, from 2015 to 2018, 5.8% and 16.3% CAGR in sales of the Trucks and Construction Equipment segments, respectively.
- **Reputational risks:** The Group has detected some issues with an emissions control component, and in light of the *Dieselgate* scandal, this news may negatively impact the company. Volvo Group also faces a litigation regarding a price fixing cartel with other truck makers from 1997 to 2011, and if found guilty the company might have to pay as much as SEK 30 billion, in addition to the damages to the brand.

Company description

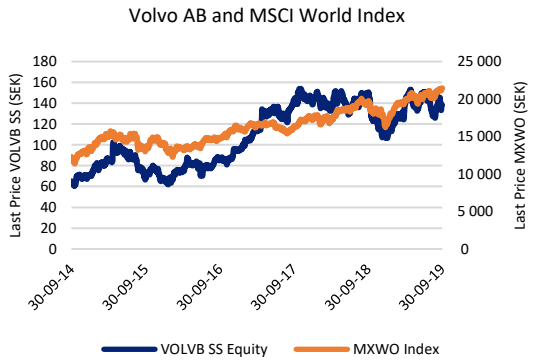
Volvo AB or Volvo Group was founded in Sweden, in 1927, and has been publicly traded in Nasdaq Stockholm since 1935. Its main activity is the manufacture of trucks, construction equipment and buses, being one of the main companies in the world in terms of market share, with 14%, 9% and 8%, respectively. In 2018, the company attained its record volume of sales, at SEK 391 billion.

Recommendation:	**HOLD**
Price Target FY20:	**162.81 SEK**
Price (as of 31-Dec-2019):	**156.90 SEK**

Source: Bloomberg Terminal | Own computations

52-week range (SEK)	112.85 -160.2
Market Cap (SEK M)	325 381
Outstanding Shares (M)	2 033

Source: Bloomberg Terminal



Source: Bloomberg Terminal

	2017	2018	2019F
Revenues (SEK M)	332 738	390 834	430 260
Gross Margin (%)	23.9	22.35	23.5
Net Income (SEK M)	22 727	26 656	34 866
EPS (SEK)	10.18	13.11	17.15
P/E	12.41	8.27	9.33
EV/EBITDA	8.89	6.2	6.77
Market Capitalization (SEK M)	310 624	235 716	325 381
YoY Return (%)	47%	-22%	48%
Dividends (SEK)	3.25	4.25	10

Sources: Bloomberg Terminal | Own Computations

Table of contents

1 Company Overview

1.1 Descriptive

Volvo AB (or Volvo Group) was founded by Assar Gabrielsson and Gustaf Larson in 1927, and its headquarters are located in Gothenburg, Sweden. Volvo Group operates as a commercial vehicle manufacturer and it became one of the world's largest manufacturers of trucks, buses, construction equipment, marine and industrial engines. Besides the industrial production, the Volvo Group also provides solutions for financing through Volvo Financial Services. The Volvo Group employs approximately 100 000 people worldwide and sells its products and services in more than 190 countries. Volvo AB has been publicly traded in the Stockholm Stock Exchange since 1935, when the company launched its Initial Public Offering (IPO).

In addition to its own brand, the Volvo Group also holds a portfolio of brands which allow it to meet the different customer demands across different geographies. The main brands of the Volvo Group can be seen in figure 1.

Figure 1 – Brands of the Volvo Group.
(Source: Volvo AB 2018 Annual Report)

Volvo Group is mostly known for its trucks, construction equipment and buses segments, which make up more than 90% of the group's revenues, and thus were considered to be the core activity of the Volvo Group. The trucks segment is the largest in terms of net sales, consisting of light and heavy-duty trucks and provides maintenance and repair services performed at its dealerships through customer service contracts. Construction equipment is the second largest segment, consisting of products for the construction, extraction, waste processing, forestry and materials handling sectors. The third largest segment is buses, in which Volvo Group is one of the world's largest manufacturers. In fiscal year 2018, the company grew its sales by 17% to SEK 391 billion, attaining the highest level of net sales in its history. Growth arose from higher sales of trucks (increase of 17%), construction equipment (increase of 27%), and in turn, having more vehicle units operating further boosted the services segment revenue (increase of 17%) derived from maintenance and services. The buses segment was the exception, having recorded flat sales. Even though the gross margin worsened from 23.95% to 22.35%, the higher sales allowed the net income to rise 22% to SEK 26.66 billion, AB Volvo's best result historically.

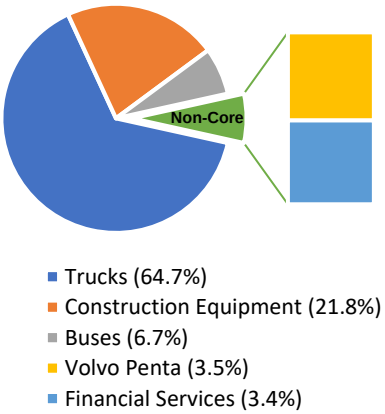


Figure 2 – 2018 Volvo AB Net Sales by Segment (% of Net Sales).
(Source: Own computations)

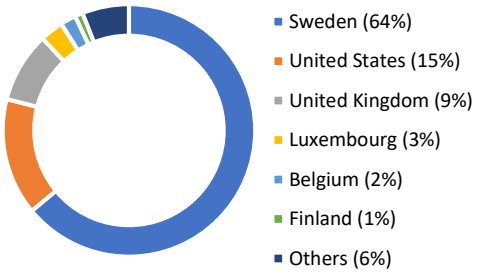


Figure 3 – 2018 Ownership of Volvo AB by Geography - Share Capital.
(Source: Volvo AB 2018 annual report)

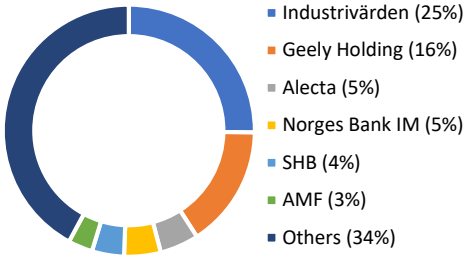


Figure 4 – 2018 Ownership of Volvo AB by Shareholders - Outstanding Votes.
(Source: Volvo AB website)

1.2 Volvo Share: Classes, Ownership and Payout

There are currently around 2 033 million shares, of which 1 573 million shares are of class B and 459 million are of class A. Even though both classes hold equal claims on the capital of the firm, while A shares are entitled to 1 vote, B shares only give 1/10th of a vote. This analysis focuses on predicting the price of Volvo AB class B shares, and in that sense, it was important to understand how the market perceived the difference in voting power of the two classes of shares, and if a premium is attributed based on that difference. By running a regression, which is shown in Appendix 1, it was concluded that there is an almost perfect positive relationship between the share price of class A and B shares. The difference between the stock price of the two classes is immaterial, and as such, for the purpose of the valuation, it was assumed that both shares hold the same value.

Since the company is majorly owned by Swedish investors (64%), the stock is traded in Nasdaq Stockholm and financial information is disclosed in Swedish Krona (SEK), this equity research was performed in that currency, as it better reflects the interests of investors. The shareholder structure is considerably stable, as the company is mainly held by long-term oriented investment funds like Industrivärden (25%) and Geely Holding (16%).

	2016	2017	2018	2019
Dividends (SEK M)	6 093	6 603	8 636	20 300
Dividend/Share (SEK)	3.00	3.25	4.25	10.0

Figure 5 – 2018 Volvo AB Dividends 2015-2019.
(Source: Volvo AB 2018 annual report)

Regarding the payout ratio, Volvo Group's shares have had a payout ratio between 33% and 53% from 2015 until 2018. In 2018, Volvo Group announced the distribution of SEK 5 in normal dividends and SEK 5 in extraordinary dividends, which led the net payout to shareholders in the year of 2019 to more than double, from SEK 8.6 billion to SEK 20.3 billion.

2 SWOT Analysis

The Volvo Group is widely recognized as one of the best brands regarding safety and for being on the vanguard of technological improvements in the industry. For instance, the Volvo Group has pioneered a variety of driver assistance systems, such as the Driver Alert Support and Lane Changing Support, which enhances awareness and alerts the driver before a situation turns critical. Volvo Group has historically had a strong focus on innovation, with an average R&D expenditure of SEK 15.7 billion in the past five years.

Strengths
- Brand Recognition - Innovation and Quality - Strong growth in Asia - Geographical Diversification - Economies of Scale - Shared know-how between business units
Weaknesses
- Bad performance in South America - Susceptible to fluctuations of the price for commodities like steel and aluminum - Reliant on suppliers for some of the more complex components
Opportunities
- Shift in focus to organic growth - Strong growth of emerging economies - Improving the services businesses - Being on the vanguard of innovation as a tool to secure market share
Threats
- Geopolitical Tensions (US-China Trade War, Brexit) - Cyclicality of the industry - Emissions scandal aftermath - Truck manufacturers' cartel litigation

Figure 6 – SWOT Analysis[1].

The Volvo Group has a strong presence in Asia (made possible by a strategy of alliances with local brands such as Dongfeng (DFCV) and Shandong Lingong (SDLG), in China, and the joint venture Volvo Eicher (VECV), in India. In China, the biggest market in the Asian region, the Volvo Group has a market share of 13% in both the heavy and medium truck segments. Moreover, the geographical diversification of sales means that the Volvo Group is less vulnerable to local political events or economic downturns.

The dimension of the Volvo Group allows it to benefit from economies of scale in product development, production, purchasing and financial services. Moreover, the shared know-how among different business areas of the Volvo Group creates positive synergies. For instance, the base engines developed by the Volvo Group are shared by construction equipment, buses, marine and industrial engines, while electric systems and transmissions are shared across most product segments. From 1999 to 2011, Volvo Group focused on M&A activity to grow its global presence, followed by a period of internal restructuring of operations, integration of acquirees and divestment from non-core segments, from 2012 to 2015. From 2016 onwards, Volvo Group has set a strategy of organic growth and increased profitability from operations.

As an emerging economy, South America is a desirable market for mature companies like Volvo Group. However, the Volvo Group has a weak presence in this region, as the representativity of South America in terms of the Volvo Group's net sales is only 5%. Furthermore, the CAGR of the revenues for this region in the period from 2014 to 2018 is -6.2%. From 2018 to 2020, Brazil, Chile, Mexico and Peru are set to invest $36.3 billion, $17 billion, $13 billion and $12.4 billion, respectively, in the improvement of infrastructures (Woof, Arminas, Woodford, & Saez, 2019) providing an opportunity for the Volvo Group, as it could increase its market share, particularly in the construction equipment segment.

The service businesses (i.e., maintenance and financial services) segment can be an important factor in decreasing the effects of cyclicality of the automotive industry. The Volvo Group can take advantage of the financial services unit and the after-sales market to better manage its cash position.

The Volvo Group will also have to deal with the emissions control components, which are degrading more quickly than expected and could cause the engines to exceed emissions limits for nitrogen oxides. This issue will cost at least SEK 7 billion in litigation costs with customers and governmental authorities.

[1] – All points mentioned in figure 6 are covered throughout the report

Furthermore, the Volvo Group is being charged of running a cartel with other truck makers in 1997-2011. Since the Volvo Group holds a 25% market share in the European market, it will be more affected by fines and compensations if the plaintiffs win the case, which may lead to SEK 30 billion of damages over the next three years to customers and regulators (Ortiz, 2019). Furthermore, this may impact the confidence of stakeholders and consequently the stock price of the Volvo Group.

3 Macroeconomic Outlook

According to the IMF, the world economy is under a "synchronized slowdown". With a 3% forecasted world real GDP growth rate for 2019, this is the lowest rate since the 2008 financial crisis (IMF, 2019). This slowdown is due to several issues, namely: demand slowdown of manufactured goods and global trade due to the implementation of higher tariffs, uncertainty regarding future trade policies and, particularly in advanced economies, low productivity growth, aging demographics and the associated slow labor force growth. Regarding 2020, the world real GDP growth rate is expected to improve to 3.4%, with emerging markets growth of 4.6% in 2020 and 4.8% in the following four years being the backbone of this improvement. Real GDP growth rate of developed economies is expected to be 1.7% in 2020 and 1.5% in the following four years.

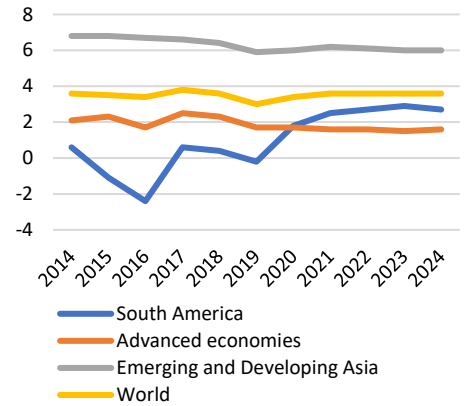


Figure 7 – Real GDP growth rate by geography (Annual % change).
(Source: IMF)

All the factors previously mentioned are contributing to a slowdown of the world's growth rate of manufacturing output, which slowed down from 3.3% in the third quarter of 2018 to 1.2% in the third quarter of 2019. This slowdown is far more evident in industrialized economies which, in the third quarter of 2019, decreased manufacturing output by 0.7%, in comparison to the third quarter of 2018. The growth rate of developing countries excluding China decreased from 3% to 0.2%, while the Chinese manufacturing output growth rate decreased from 6.2% to 5.1%.

Regarding long run forecasts, the Global Financial Stability Report predicts interest rates to keep "low for long" (IMF, 2019) and the average long-term real GDP growth rate is expected to be around 2.3% (OECD, 2018). The low interest rates environment is explained by the expansionary monetary policy followed mainly by developed countries to face deflationary pressures. Although a low interest rates environment is an important factor for confidence and investment growth, the slowdown in the world real GDP and manufacturing output are concerning signs that will definitely hurt Volvo Group performance, mainly in Europe.

4 Industry Overview

4.1 Trends

The integration of connectivity and automation technologies is a disruptive trend in this industry. While connectivity refers to the usage of internet and cloud-based information, automation refers to the replacement of human agents for tasks which can be performed by artificial intelligence. In the truck industry, developing these technologies will allow the use of truck-platooning, an already existing concept which involves linking a fleet of trucks, and allows the reduction of fuel consumption and emissions, as air resistance is significantly decreased. Therefore, connectivity and automation will improve not only safety but also energy and environmental efficiency and ultimately productivity. Volvo Group is widely recognized as one of the safest auto brands in the world, having pioneered different safety systems (e.g.: the three-point seatbelt and the side-impact airbags), which constitutes an asset relative to its competitors. To ensure that the Volvo Group will be able to hold a competitive advantage on this field, it will continue to invest on improving safety systems, aiming to further reduce the number and severity of accidents involving its vehicles will.

As world population grows and concentrates more than ever in urban areas, traffic pressures arise. By 2030, more than 66% of the population will live in urban areas, giving public transportation a crucial role when it comes to solving this issue. Therefore, Volvo Group will benefit from increasing demand for construction equipment as well as buses, as new infrastructures will be necessary to satisfy the growing and ever more concentrated world population.

As a company which aims to preserve the planet, Volvo Group is also recognized as pioneer when it comes to green vehicles solutions. Volvo Group will continue to invest in more carbon efficient vehicles and plants. For instance, in the construction equipment, Volvo Group will launch, in 2020, a range of electric compact wheel loaders and compact excavators, stopping new diesel engine-based development for these models. But the Volvo Group is not only investing in reducing emissions from its vehicles by improving fuel efficiency and offering alternative and lower emissions fuels (e.g.: compressed natural gas, liquefied natural gas), but also by decreasing the production sites emissions in 20% between 2015 and 2020. This strategy is essential to Volvo Group as there is an increasing awareness of the public about climate change, the corporate social responsibility and the ever more demanding emissions

standards for diesel and gasoline vehicles. Volvo Group will continue to leverage on this trend as being part of the brand's image and thus allowing it to remain one of the most ambitious brands in regard of environmental and efficiency concerns. Regarding competition, we expect an intensification of the competition and further consolidation of the main companies in the industry. This will result in fewer but larger and more efficient competitors. In our research, we find that the Volvo Group is well positioned in terms of efficiency and scale to secure its position as one of the key companies in this industry.

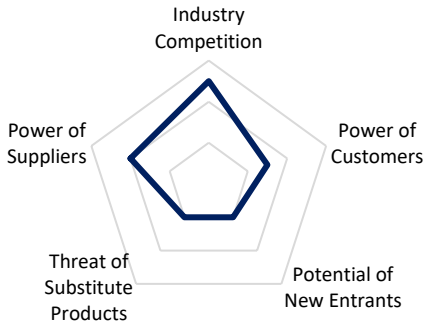


Figure 8 - Porter's Five Forces Analysis. (Source: Own computations)

4.2 Porter's Five Forces

In this section we further analyze the competitive environment faced by the Volvo Group in its core activities, structuring the analysis with resort to Porter's Five Forces. In figure 8, a schematic representation of the different forces can be observed, taking into account that the further away a point is from the center of the figure, the stronger that specific force will be.

Industry Competition: Very High

Volvo Group operates in a market which is dominated, at a global level, by a small number of companies with a big dimension. In the US, 97.8% of the market share of class 8 truck manufacturer companies is held by Daimler, Paccar, Navistar and Volvo AB (Statista, 2018). Regarding the construction equipment industry, roughly 40% of the world market share is held by Caterpillar, Komatsu, Hitachi and Volvo AB. In this setting, being on the vanguard in terms of bringing disruptive and innovative technologies to existing products is a fundamental process in securing market share. Customer relations are another important factor in customer retention.

Potential of new entrants: Low

Being a cyclical industry with high fixed and variable costs, economies of scale are an essential asset to ensure competitiveness. Moreover, as an industry of established brands, brand recognition and customer loyalty provide natural barriers to new entrants, and the need to reinvest in R&D to ensure competitiveness further hinders new entrants from venturing into this industry.

Power of suppliers: Dependent on Supplier Nature

Products of the Volvo Group consist mainly of heavy machinery, but recent technological improvements have led to the integration of delicate and complex technology, which many times must be tailored to the needs of each product. As such, the analysis of this force must be divided into two subgroups.

First, the suppliers of basic raw materials such as steel, aluminum, copper or rubber, and second the suppliers of more complex electronic components. The first group exists in great abundance and diversity, and they vary from region to region. These suppliers make up the majority of the 51 000 suppliers that Volvo engages with in its activity. The lack of organization and replaceability of these suppliers makes their overall bargaining power small.

The latter group, on the other hand, has a high bargaining power mostly due to the quality arising from the specialization process. These suppliers are involved from the beginning of the product engineering and industrial processes are tailored according to product specificity, resulting in high switching costs. Some of these suppliers include BPW, Jost, SAF Holland, Schmitz Cargobull, Borg Warner, Wabco, Mahle and Bosch.

Power of customers: Medium

Even though the customer base of the Volvo Group is not organized and quite disperse, strong customer relationships and broad customer portfolio are essential to keep a solid stream of revenues, not only regarding the acquisition of new vehicles and renewal of fleets or specific parts, but also in respect to maintenance and financial services sales. Truck purchasers consist mostly of transportation companies, such as DHL, UPS, XPO or the Maersk Group. Construction equipment is mostly purchased by construction companies and mining companies, like Skanska or PowerChina. The main purchasers of buses are collective transport companies, such as Greyhound, Megabus or Flixbus, in addition to public transport companies. Prices remains a key criterion when customers decide which brand they will choose and given the customer loyalty and the fact that orders often consist of multiple vehicles, bargaining power of customers is medium.

Threat of substitute products: Low

Trucks and buses are mainly used for land transportation of goods and people, enjoying a great deal of flexibility in terms of the routes and destinations, and serving as an intermodal transportation asset. Furthermore, goods distribution and passenger transportation routes are already established, so a drastic change in the choice of means of transportation is not expectable. Construction equipment serves a diversity of purposes, like excavations, earthmoving, construction, extraction or waste processing, and as such there are not many products to choose from in terms of fulfilling those purposes, hence also having a low threat of substitute products.

5 Comparative Analysis

5.1 Stock Performance

From 2015 to 2018, the Volvo Group shows a positive trend in regard to the financial metrics ROA, ROE and ROIC, which provides a positive insight in regard to its overall performance. In 2018, the ROE, ROIC and ROA were, respectively, 22%, 11% and 6%, a result above the segment-weighted[2] average of the industry for the metrics under analysis of 15%, 8%, and 4%, respectively, showing that the Volvo Group is outperforming the industry.

In the last four years, Volvo Group has consistently outperformed the MSCI World Index and the S&P 500 in good times, but underperformed the same indexes in bad times, which is a solid indicator of the cyclicality of the industry. Furthermore, the four-year CAGR of the Group's stock is 11.42%, meaning that all in all, in spite of the economic cycles, the Volvo Group has managed to outperform both of these indexes, with MSCI World attaining a 5.83% CAGR and S&P500 attaining an 8.5% CAGR.

The Volvo Group has outperformed most of its peers in terms of stock performance, with the exception of Komatsu, Deere, Caterpillar and Kubota, which attained four-year CAGRs of 23.1%, 20.6%, 15.8% and 12.7%, respectively. These companies are all from the construction equipment segment, which represented 25% of the Volvo Group's sales in 2018. This indicates that the different business units of the Volvo Group have contributed to it outperforming other companies in the peer group, which unlike Volvo Group, are dedicated solely to the manufacture of trucks and buses. The year on year stock return data can be found in Appendix 2.

5.2 Profitability

The Volvo Group's sales have achieved a 3-year CAGR of 7.74%, a result which is slightly better compared to every competitor from the truck and bus industry, and also fares well when compared to the average CAGR of the construction equipment competitors, which on average grew its sales by a CAGR of 8.02%.

In terms of gross margin, there is a clear distinction between the segment of

	2015	2016	2017	2018
Volvo AB				
ROA	**4%**	**3%**	**5%**	**6%**
ROE	**19%**	**15%**	**20%**	**22%**
ROIC	**8%**	**7%**	**9%**	**11%**
Paccar *				
ROA	8%	2%	8%	9%
ROE	23%	8%	23%	26%
ROIC	10%	3%	9%	11%
Tata Motors *				
ROA	6%	5%	3%	3%
ROE	23%	17%	11%	12%
ROIC	12%	13%	8%	5%
Man Se *				
ROA	1%	0%	2%	3%
ROE	3%	0%	5%	12%
ROIC	2%	-2%	0%	1%
Daimler *				
ROA	4%	4%	4%	3%
ROE	17%	15%	17%	11%
ROIC	6%	5%	5%	4%
Hino Motors *				
ROA	7%	6%	4%	4%
ROE	20%	15%	11%	11%
ROIC	13%	11%	8%	8%
Sany Heavy **				
ROA	0%	0%	3%	9%
ROE	0%	1%	9%	21%
ROIC	3%	2%	8%	13%
Hitachi **				
ROA	2%	1%	2%	4%
ROE	8%	6%	8%	12%
ROIC	40%	38%	43%	7%
Komatsu **				
ROA	6%	5%	4%	7%
ROE	11%	9%	7%	12%
ROIC	8%	7%	6%	8%
Kubota **				
ROA	6%	5%	5%	5%
ROE	14%	12%	11%	11%
ROIC	8%	6%	15%	16%
Caterpillar**				
ROA	3%	0%	1%	8%
ROE	16%	0%	6%	44%
ROIC	6%	0%	2%	14%
Deere & Co **				
ROA	3%	3%	3%	3%
ROE	25%	23%	27%	23%
ROIC	6%	5%	6%	6%

Figure 9 – Volvo AB and Peers Profitability Ratios.
* - Manufacturers of Trucks and Buses
** - Manufacturers of Construction Equipment
(Source: Bloomberg)

[2] – Whenever industry weighted averages are computed, these utilize information from the peers considering the weight of the different segments of Volvo AB in 2018 net sales. Namely, 75% weight is attributed to trucks and buses and a 25% weight is attributed to construction equipment.

construction equipment, which averages a gross margin of 28.6%, and the segment of trucks and buses, where the average gross margin takes a significantly lower value of 19.0%. This distinction can be seen graphically in figure 10, as all competitors from the construction equipment segment, represented with the orange color, are placed above those with the light blue color, which are manufacturers of trucks and buses. The Volvo Group places in the middle of those two groups, with a gross margin of 22.35% in 2018. Once more, we can observe how the different segments of the Volvo Group provide a competitive advantage over manufacturers of truck and buses exclusively.

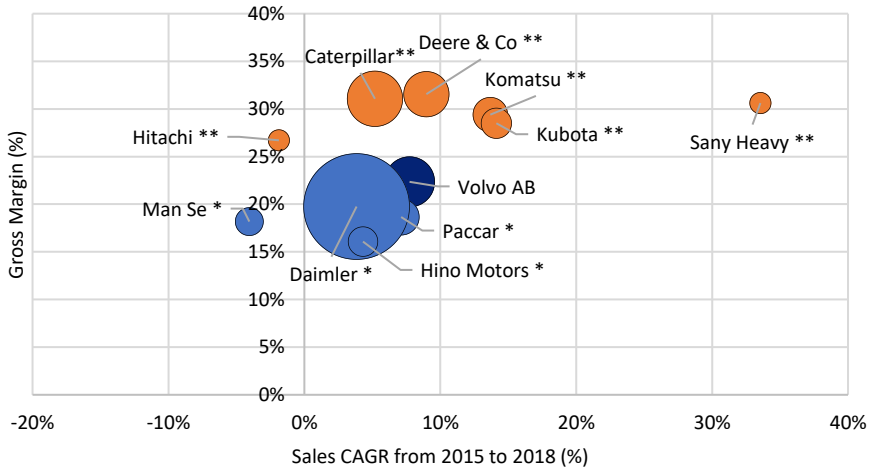


Figure 10 – Volvo AB and Peers Gross Margin, Sales Growth and Revenue Comparison 2018. (Source: Bloomberg)

6 Financial Position

6.1 Key Ratios

	Inventory Turnover	Current Ratio	Quick Ratio
Volvo AB	**5.12**	**1.21**	**0.87**
Paccar *	18.09	4.28	4.00
Tata Motors *	4.87	0.85	0.57
Man Se *	3.47	0.85	0.58
Daimler *	4.87	1.24	0.94
Hino Motors *	6.92	1.14	0.73
Sany Heavy **	4.03	1.53	1.19
Hitachi **	5.28	1.40	1.02
Komatsu **	2.79	1.82	1.05
Kubota **	3.63	1.78	1.37
Caterpillar**	3.50	1.37	0.96
Deere & Co **	5.09	-	-
Segment-Weighted Avg.	6.24	1.53	1.19

Figure 11 – Volvo AB and Peers Inventory Turnover, Current and Quick Ratios 2018. (Source: Bloomberg | Thomson Reuters)

Regarding the liquidity ratios, in 2018, in the short-term Volvo Group AB is in a stable situation, as the current ratio is 1.21, even though it is lower than the segmented weighted average of 1.53, showing that Volvo Group has a lower buffer against current liabilities than the average peer. This can be seen graphically in Appendix 3, as the area representing current assets is greater than that of current liabilities. In 2018, the quick ratio achieved was 0.87, which is again lower than the 1.19 industry's average.

In 2018, the peers' average inventory turnover ratio was 6.47, while Volvo achieved a lower value of 5.12. Since Volvo Group has a lower inventory turnover ratio in comparison to its competitors, it may be seen as a consequence of weaker than expected sales due to a slowdown of demand for the company's products. Likewise, Volvo Group takes longer to sell its inventory, being less efficient in managing orders and inventories when compared to the industry, and thus it may imply higher costs with warehousing.

6.2 Capital Structure

Unlike most of its peers, the Volvo Group has a capital structure with a significant amount of debt, given its 2018 net debt to equity ratio of 0.27, significantly higher than segment-weighted average of 0.11. The Volvo Group's debt amounts up to SEK 104 billion with a weighted average maturity of 9 years. Volvo Group has had a stable credit rating of A3, attributed by Moody's. This debt consists mostly of corporate bonds with a floating coupon.

In spite of this increased reliance on external financing, the Volvo Group maintains a strong financial position. With an interest coverage ratio of 16.08 in 2018, the Volvo Group is more than able to keep up with its interest payments, all the while enjoying favorable refinancing conditions, given its solid credit rating.

7 Valuation

7.1 Sales

Sales were forecasted as a result of price and units sold. Regarding price, we apply the expected inflation, in each region and for the duration of the forecast, to the average price per unit. The underlying assumption is that the proportion of sales for the different vehicles in each segment (trucks, buses and construction equipment) will remain constant, hence the units will vary through time, but prices will be affected only by the specific inflation in each region.

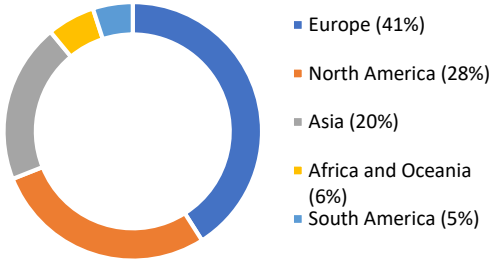


Figure 12 – 2018 Share of Net Sales by Region. (Source: Volvo AB 2018 annual report)

In regard to the units sold, the truck segment achieved 226 490 units in 2018. By 2028, it is expected to sell 295 581 units, implying 1.8% CAGR. The construction equipment segment, which sold 82 654 in 2018 is forecast to sell 134 475 units by 2028, implying a 4.5% CAGR. With respect to the buses segment, in 2018, 8 426 units were sold while, in 2028, it is expected sell 12 255 units, implying a 2.1% CAGR.

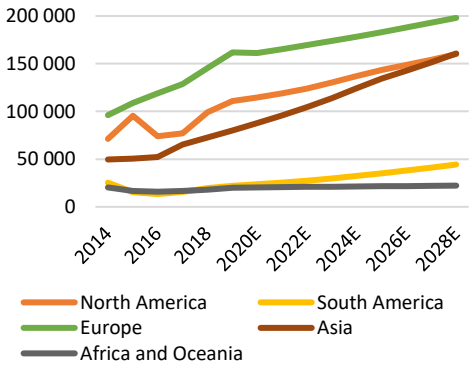


Figure 13 – Core Revenue by Geography (SEK M). (Source: Own computations)

The short-term outlook in the industry is not looking great (Imode & Okur, 2019), with a global slowdown in the truck manufacture industry that is clearly visible by analyzing the number of global Volvo truck orders, which dropped from 65 thousand units in the third quarter of 2018 to 35 thousand in same period of 2019, a decrease of 45%. A similar scenario can be observed in the bus segment, which in the same period registered a decrease in orders of 32%. The construction equipment segment faces a less drastic slowdown, with orders intake decreasing 9%.

In the forecast, however, these decreases are not perceptible in the value of revenues. This is due to the fact that in our research, the long-term cyclicality of sales was smoothened out, so the focus was to capture the long-term growth of the Volvo Group and not year specific shocks. In this context, we estimated long-term growth expectations for the company per segment in each region.

In Appendices 4 and 5, an overview of the evolution and forecast of the Volvo Group's net sales by segment and gross margin can be found.

7.1.1 Europe

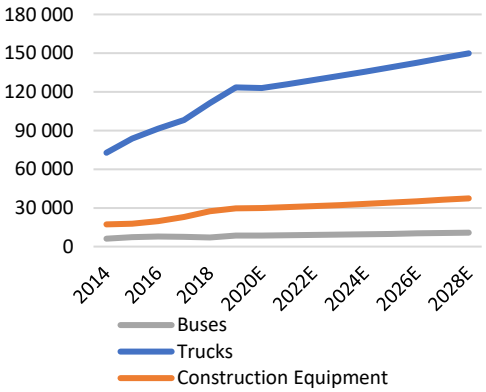


Figure 14 – Core Revenues in Europe (SEK M).
(Source: Own computations)

The Euro Zone real GDP growth rate is expected to be between 1.5% and 1.7% during the period from 2019 to 2024. European countries have been negatively affected by the Brexit uncertainty which is still the main issue clouding the EU's future. Particularly in the EU, there is an increasing of public incentives and regulations on the side of manufacturers to increase the efficiency and minimize the environmental impact of its vehicles (e.g.: Clean Vehicles Directive of the European Union and Regulation (EU) 2019/1242). Geopolitical conflicts such as US-China trade war may decrease the sales of vehicles due to a slowdown in international trade and the fears of lower world GDP growth. More recently, the increase of tariffs of the European goods exported to the USA can also negatively affect Volvo Group sales. Regarding the evolution of sales, we do not expect a substantial increase in sales of any of the business segments. Thus, a core net sales CAGR between 2020 and 2028 of 2.3% is expected in this geography. This is the region with the lowest CAGR among the five where Volvo Group operates.

7.1.2 North America

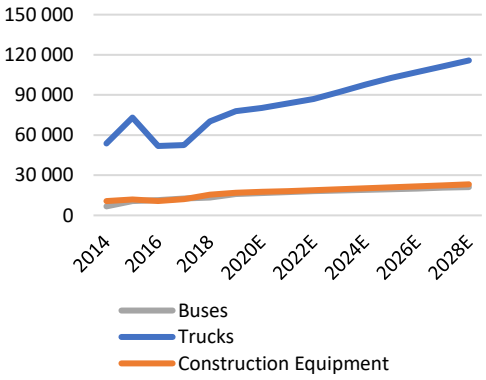


Figure 15 – Core Revenues in North America (SEK M).
(Source: Own computations)

Regarding the US economy, the real GDP growth rate is expected to decrease from 2.1% in 2019 to 1.7% in 2024. An increase of public and private sector investments in residential, commercial, healthcare and educational infrastructure construction projects will support growth in the truck and the construction equipment industry in the next decade (e.g.: infrastructure initiative budgeted in USD 200 billion in the next decade to boost a projected USD 1.5 trillion in state, local government and private sector investments). Additionally, estimates from American Society of Civil Engineers suggest the USA require USD 3.6 trillion to repair, upgrade and modify its transport infrastructure. Following this outlook and trends, we expect a 2020-2028 core net sales CAGR of 4.2% in North America.

7.1.3 Asia

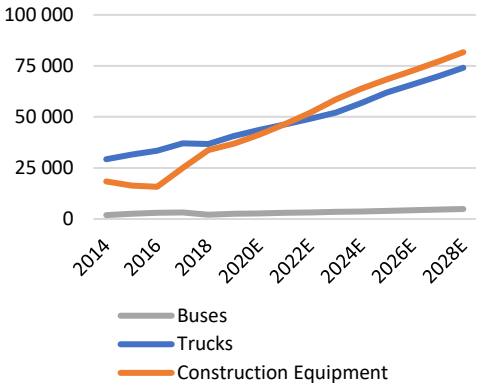


Figure 16 – Core Revenues in Asia (SEK M).
(Source: Own computations)

The Chinese real GDP growth rate is expected to slow down from 6.1% in 2019 to 5.5% in 2024. The trade war with the US is a direct cause of the growth decrease and the slowing of Chinese domestic demand. Following on global trends on environmental regulation, China has introduced the China IV emissions laws, which will accelerate vehicle replacement cycle and help boost sales of the Volvo Group.

Regarding the construction equipment segment, the overall growth in the industry is caused most notably by the development of emerging economies, such as China or India. China's infrastructure spending sums up to more than USD 4 trillion with the 'One Belt, One Road' Initiative. Volvo Group will further benefit from this environment through its joint ventures Dongfeng and Shandong Lingong.

The Indian real GDP growth rate will be 6.1% in 2019 and it will keep at least at 7% a year until 2024. The Indian government has launched several investment programmes which explain this strong growth, such as in the road sector which is worth more than USD 90 billion. Until 2022, a total of 200 000 kilometers are expected to be completed. Additionally, the government aims to invest in energy and residential projects housing (e.g.: 100 Smart Cities Mission, Bharatmala scheme, Housing for All 2022) which will further boost net sales of Volvo Group mainly through its joint venture Volvo Eicher. Following the Chinese and the Indian market outlooks, the 2019-2028 expected core net sales CAGR of Volvo Group is 8%. This CAGR is the second highest CAGR among the five regions analyzed, being just slightly below the forecasted CAGR for the South American region.

7.1.4 South America

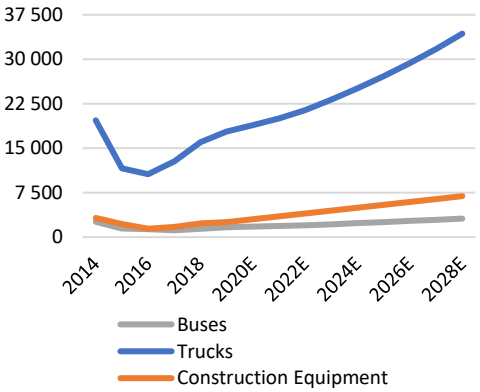


Figure 17 – Core Revenues in South America (SEK M).
(Source: Own computations)

The South American real GDP growth rate will increase from -0.2% in 2019 to 2.7% by 2024. By 2020, the South America infrastructure investment will reach a value of USD 175.8 billion. The demographic trends and the implementation of legislative reforms will favor the investment in these economies. There are 1711 large-scale projects expected with a combined value of USD 829 billions. Brazil, Chile, Mexico and Peru will be the main driver of overall investment in the next years in this region. Brazil has projected 421 projects valued at USD 241.5 billion, being the number one country of South America regarding the number and total amount committed to large scale projects. These projects aim to increase the offer of residential sites to population (e.g.: Programme '*Minha*

Casa, Minha Vida'), to improve transportation infrastructures (e.g.: Highway Duplication in São Paulo) as well as to develop power plants (e.g.: Programme '*Plano Decenal de Expansão de Energia 2027'*).

However, deteriorating external conditions such as global trade tensions, higher US interest rates and slowing global growth could slow growth in Latin America. Additionally, political uncertainty in Venezuela, Chile, Peru and Paraguay will decrease confidence on the investors side. Following the macroeconomic outlook, the 2019-2028 expected core net sales CAGR of Volvo Group is 8.1%. Being a region with mostly emerging economies and after some years of low or even negative growth, South America is expected to recover some of its economic power and thus it will be the region with highest expected CAGR.

7.1.5 Africa and Oceania

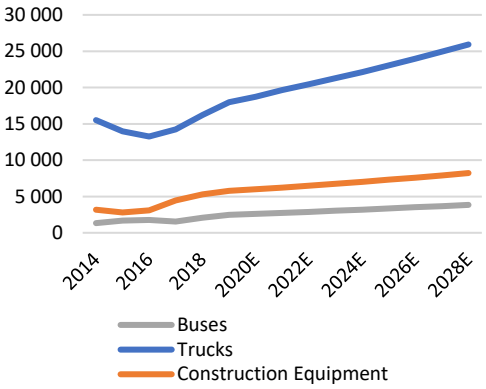


Figure 18 – Core Revenues in Africa and Oceania (SEK M).
(Source: Own computations)

The African real GDP growth rate will speed up from 3.2% in 2019 to 4.2% in 2024. By 2030, the percentage of people living in urban areas in this continent will grow from 36% in 2010 to 50% by 2030. Many countries such as Nigeria are setting government programmes to revitalize the economy by developing and improving the countries' roads and railways, but also energy production and distribution infrastructures. There are currently 303 large scale projects in African countries infrastructures which sum up USD 584 billion.

In Oceania, the real GDP growth rate will increase from 1.8% in 2020 to 2.6% in 2024. The Australian government is projecting a USD 50 billion infrastructure investment programme including road, rail, shipping and aviation infrastructures. These investments aim to face the increased domestic freight duties which between 2010 and 2030 will grow by 80% mainly due to increased population which will achieve 47.36 million people (increase of 20% in comparison to 2018). The major investments are the development of the Western Sydney Airport (USD 6-8 billion), as well as initiatives on roads and bridges such as Black Spot, Roads to Recovery, Bridges Renewal and Beef Roads (USD 6 billion).

Even though Africa and Oceania markets are small in comparison to the European, American and Asian markets, they present good investment opportunities in the next decades mainly due to demographics and a strong public supported investment in national infrastructures. Following the African and Oceania's macroeconomic outlooks, the 2019-2028 expected core net sales CAGR Volvo Group for this region is 4.2%.

	Gross Margin	Net Margin
Volvo AB	**22.35%**	**6.37%**
Paccar *	18.66%	9.34%
Tata Motors *	-	3.11%
Man Se *	18.18%	5.58%
Hino Motors *	19.76%	2.79%
Daimler *	16.08%	4.33%
Komatsu **	30.62%	7.85%
Sany Heavy **	26.71%	11.02%
Hitachi **	29.40%	6.26%
Kubota **	28.50%	7.49%
Deere & Co **	31.07%	6.34%
Caterpillar**	31.55%	11.23%
Segment-Weighted Avg.	21.40%	5.96%

Figure 19 – Industry Gross and Net Margins 2018. (Source: Bloomberg | Own computations)

7.2 Gross Margin

Regarding the forecasting of the gross margin, it will follow a three-stage-development.

Stage 1: From 2019 to 2021, the gross margin will increase from 23.5% to 24% since the company is already in an organic growth stage. In other words, Volvo Group is improving its performance through efficiency, for instance, by better managing its energy consumption in the production stage, it aims to reduce energy usage by 8% between 2015 and 2020. This way the Volvo Group will be able to tackle the cost-efficiency and environmental issues. Additionally, the construction equipment segment, which has a higher gross margin compared to the trucks and buses segment, is expected to increase its weight in Volvo Group's total revenues from 23,4% in 2018 to 26.2% in 2028.

Stage 2: From 2021 to 2024, the gross margin will cease to increase, and stabilize at the 24% level, as maximum output efficiency is reached, and further R&D costs are allocated significantly to innovation instead of optimization of industrial processes. Additionally, fiercer competition in the industry, which is mostly coming from new OEMs based in emerging economies (e.g.: Foton) and the global demand slowdown will keep pressuring markups down. Nonetheless, the 2018 gross and net margins of Volvo Group are higher than the segmented-weighted average of the industry, showing that it is better prepared to face increasing competition in the industry as well as a downturn in the industry. Nevertheless, when GDP slows down the demand for energy and commodities tend to decrease and thus the price of those tend to decrease, providing a source for Volvo Group to recover some margin.

Stage 3: From 2024 to 2028 the gross margin will gradually decrease from 24% to 23.25% as with the change in the vehicles production paradigm Volvo Group will have to adapt its plants to new machinery necessary to build mainly electric motors and other propulsion power (e.g.: hydrogen) which will require some time to achieve larger economies of scale. Additionally, according to (UNCTAD, 2019), in 2030 the demand for energy will be 30% higher than in 2020, which will result in an increase in the price of energy and thus further pressure on Volvo Group's gross margin.

Furthermore, a breakdown of the Volvo Group's net margin can be found in Appendix 6.

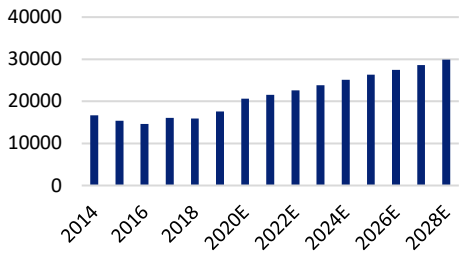


Figure 20 – Volvo R&D Expenditure SEK M).
(Source: Own computations)

7.3 Research and Development

As seen previously, innovation will be essential in securing market share. In this context, R&D expenses for the Volvo Group will increase throughout the forecast period, representing roughly 5% of the core net sales forecast for each year. By 2029, we forecast R&D expenses of SEK 29.8 billion, which is almost twice the of the Volvo Group's current R&D spending of SEK 15 billion.

7.4 WACC

	Lev. Beta	Net D/E	Unlev. Beta	Statutory Tax Rate
Volvo AB	**0.86**	**0.27**	**0.71**	**22%**
Paccar *	1.27	-0.22	1.53	21%
Tata Motors *	1.01	0.38	0.80	30%
Man Se *	0.11	0.33	0.09	30%
Hino Motors *	0.60	0.20	0.52	31%
Daimler *	1.00	-0.38	1.36	30%
Komatsu **	0.52	0.19	0.46	31%
Sany Heavy **	0.74	0.13	0.67	25%
Hitachi **	0.54	0.17	0.48	31%
Kubota **	0.54	0.32	0.44	31%
Deere & Co **	1.17	0.07	1.10	21%
Caterpillar**	1.30	0.01	1.29	21%

Figure 21 – Volvo AB and Peers – Comparative of Betas[3].
(Source: Bloomberg)

The long-term Net Debt to Equity ratio of the Volvo Group will keep at the current level of 42%, obtained through own computations using the reformulated statements, as the Volvo Group is already a mature company (Koller, Goedhart, Wessels, & McKinsey & Company, 2010). Given the fact that Sweden has passed a bill which will gradually reduce the corporate income tax to 20.6% until 2021, we use that rate in the valuation model.

The MSCI World Index and the S&P500 are both suitable proxies for the market return, but ultimately this analysis takes the MSCI World Index as its reference market proxy. The computed market return is 11.79%, in line with the returns of the MSCI World Index from Q3 2014 to Q3 2019, hence utilizing the latest data available at the time the valuation model was developed. The risk-free rate was assumed to be 1.70%, which is the yield on US Government 10-year bonds, matching the forecast time horizon. Despite the fact that the cash flows are denominated in SEK, both the market return and the risk-free were obtained using a USD denominated stock index and the US Government Bonds. The assumption is that the market risk premium which is used as an input in the Capital Asset Pricing Model (CAPM) would be the same in the end, regardless of using a US or Swedish proxy. The resulting market risk premium is considerably high, at 10.09%, however given the fact that the β of the industry was computed using the same index and period of analysis, we expect the CAPM to hold. This also explains the low β, which is lower than what would be expected in a cyclical industry. The summary output for the computation of the Volvo Group β can be found in Appendix 7.

WACC Highlights	
Risk-Free	1.70%
Market Return	11.79%
Market Risk Premium	10.09%
Tax Rate	20.6%
Cost of Debt	2.96%
Levered Beta	1.08
Cost of Equity	12.58%
WACC	9.57%
Perpetuity Growth Rate	2.87%
Net Debt / Equity	0.42

Figure 22 – WACC Highlights (SEK M).
(Source: Own computations)

The long-term cost of debt of the Volvo Group is 3.26%. That result was obtained departing from the yield to maturity (YTM) of two 50-year Volvo AB bonds, with a weighted average YTM of 4.22%, adjusting for the probability of default and expected recovery rate. The Volvo Group's credit rating has been

[3] – The net debt to equity ratios presented in this figure are used only to compute the industry β and for comparative purposes

Credit Rating Agency	Rating
Moody's	A3
S&P	A-

Figure 23 – Volvo AB credit rating.

DCF Highlights	
PV of Terminal Value	269 046
NPV of Free Cash Flows	417 533
Non-Core Business Value	8 426
Enterprise Value	425 959
Net Debt	107 284
Minority Interest	3 076
Equity Value	315 599
Shares Outstanding	2 033
Target price per share excluding dividends (SEK)	155.24
Net payout per share in 2020 (SEK)	7.57
Target price per share including dividends (SEK)	162.81

Figure 24 – DCF Highlights (SEK M).
(Source: Own computations)

stable over the past years, with Moody's credit rating agency attributing Volvo AB an A3 investment grade. We estimated a cumulative probability of default of 2.26% over the time horizon of the weighted average maturity of the Volvo Group's outstanding debt and a recovery rate of 47.9% (Moody's, 2018).

The final result for the WACC was 9.57%, which led to an estimated enterprise value of SEK 425 959 million. Assuming a market value of net debt of SEK 107 284 million equal to the forecasted book value of net debt, and after adjusting for minority interests, the target stock price before dividends is SEK 155.24.

7.5 Value Creation Drivers: Growth Rate, RONIC and ROIC

As Volvo Group is already a mature company, good investments opportunities cease to exist, and thus both ROIC and RONIC are expected to decrease towards the level of the firm's cost of capital, and thus investment rates (IR) tend to decrease. Because the RONIC and the IR of new capital both start decreasing, the growth rate of operational free cash flows (g) tended to decrease as showed in figure 25.

By 2027 and 2028, the Volvo Group will already have reached a RONIC very close to WACC, following the long-term equilibrium condition of RONIC being similar to the WACC. This may be seen as the peak of maturity of the Volvo Group, and thus IR will tend to stabilize and decrease as times goes by. From 2028 onwards, a terminal value for the core free cash flow was computed, using a perpetuity growth formula. Following the organic growth equation, the perpetuity growth rate of core free cash flows is 2.87%, considering a perpetuity RONIC of 11.5% and reinvestment rate of 25%. This seems like a reasonable value, as the average long-term world GDP real growth rate is 2.3% (OECD, 2018).

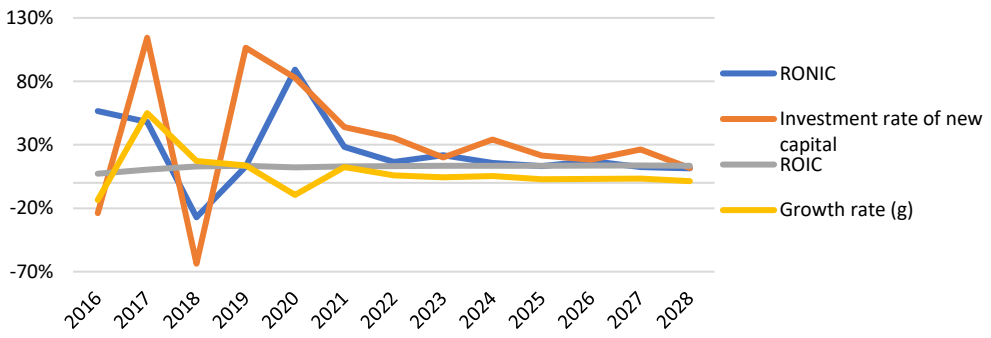


Figure 25 – Value Creation Drivers (%).
(Source: Own computations)

7.6 Sensitivity analysis

In a WACC valuation, the stock price is very susceptible to changes in some variables, even if these changes do not appear to be significant at first sight. To analyze the impact of these changes, a sensitivity analysis was performed with two of the most important variables, the WACC and the perpetuity growth rate, and the changes in stock price were tracked, added to the capital gains (dividends). These variables were chosen as they both have significant impact on the total net present value of the free cash flows. The WACC in itself is influenced by a number of variables, like the market risk premium, risk-free rate and choice of comparables, among others, and as a discount rate it is deeply related to the present value of future cash flows. The perpetuity growth rate is relevant because it ultimately impacts the terminal value, which in our valuation makes up nearly 60% of the enterprise value of the Volvo Group computed through the DCF. The analysis was built according to the decision rule described in the Disclosures and Disclaimers chapter. If the resulting target stock price (including capital and cash gains) was included in the green-shaded cells' area the recommendation would be to go long on the stock, as it is undervalued by the market and would yield the investor a return of more than 10%. If the resulting target price was included in the yellow-shaded cells' area, the recommendation would be to hold the current position. If the resulting target price was included in the red-shaded cells' area, the recommendation would be to sell the stock as it is overvalued by the market. In figure 26, the break-even points for the perpetuity growth rate and the WACC which dictate different investment decisions are summarized. In figure 27, the results of the sensitivity analysis can be seen in detail.

Break Even decision	g	WACC
Sell	g<2.74%	WACC>9.65%
Hold	2.74%≤g ≤3.44%	9.18%≤WACC≤9.65%
Buy	g>3.44%	WACC<9.18%

Figure 26 – Breakeven– WACC and g (%).
(Source: Own computations)

Perpetuity Growth Rate (g) \ WACC	8.77%	8.97%	9.17%	9.37%	9.57%	9.77%	9.97%	10.17%	10.37%
2.12%	173.24	166.54	160.22	154.26	148.62	143.28	138.21	133.40	128.82
2.37%	179.08	171.97	165.28	158.97	153.02	147.39	142.07	137.02	132.22
2.62%	185.40	177.82	170.72	164.03	157.74	151.80	146.19	140.88	135.84
2.87%	192.25	184.16	176.59	169.48	162.81	156.53	150.60	145.00	139.70
3.12%	199.71	191.04	182.94	175.37	168.27	161.61	155.33	149.42	143.83
3.37%	207.85	198.53	189.85	181.75	174.18	167.08	160.42	154.16	148.25
3.62%	216.79	206.72	197.37	188.68	180.58	173.01	165.92	159.26	153.00

Figure 27 – Sensitivity Analysis: WACC and g effect on Volvo AB Stock Price.
(Source: Own computations)

7.7 Multiples

	P/E	EV/ Sales	EV/ EBITDA	EV/ EBIT	EV/ Net Inc.
Volvo AB	**x9.47**	**x0.81**	**x6.2**	**x9.71**	**x12.68**
Paccar *	x9.33	x0.68	x4.27	x5.95	x7.29
Tata Motors *	x13.39	x0.49	x4.67	x16.23	x15.74
Man Se *	x20.5	x1.46	x13.18	x54.65	x26.23
Hino Motors *	x15.95	x0.56	x7.46	x12.9	x20.18
Daimler *	x6.77	x0.19	x1.92	x3.09	x4.38
Komatsu **	x17.76	x1.75	x10.86	x16.09	x22.25
Sany Heavy **	x10.47	x1.33	x7.94	x10	x12.06
Hitachi **	x15.17	x1.18	x8.5	x11.86	x18.92
Kubota **	x14.32	x1.46	x11.32	x14.29	x19.51
Deere & Co **	x19.26	x1.3	x6.76	x9.23	x20.56
Caterpillar**	x12.49	x1.42	x7.02	x9.36	x12.63

Figure 28 – Multiples of Volvo AB and peers.
(Source: Own computations)

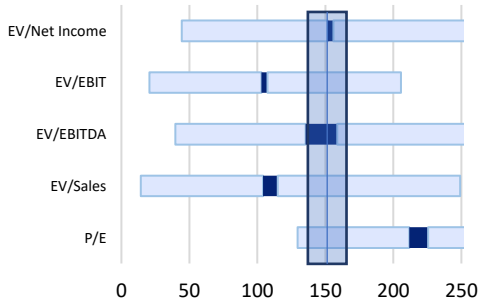


Figure 29 – Football Field: Volvo AB Share Price.
(Source: Own computations)

In our analysis, we divided the peers into two different groups, on the one hand the companies in the construction equipment industry, and on the other hand companies in the trucks and buses manufacturing industry. We then attributed a weight to each of these industries, based on the proportion of net sales per segment of the Volvo Group in 2018 attributed to each industry. Initially, we computed several different multiples, and despite showing some dispersion we validated the price range in which Volvo AB stock is traded. The results can be seen on the football field in figure 29, and it is important to keep in mind that as Volvo Group operates in a cyclical industry, using 1-year forward metrics may distort the results.

The stock price obtained using the P/E multiple is a clear outlier as it suffers a positive double distortion effect: Volvo Group's capital structure is more reliant on debt than its peers, hence a per share analysis will overestimate the value of Volvo Group shares. Additionally, 2019 is on track to become yet another record-breaking year for Volvo Group in terms of earnings, breaking the SEK 400 billion mark, which also contributes to the overestimation of stock price using this multiple.

Given the dispersion of the different multiples, we opted for increasing the depth of the multiples analysis and to focus on the EV/EBITDA multiple, which focuses solely on operational performance and avoids distortions from company specific elements like interest, which depends on the capital structure of the firm or taxes which vary depending on the location of the company.

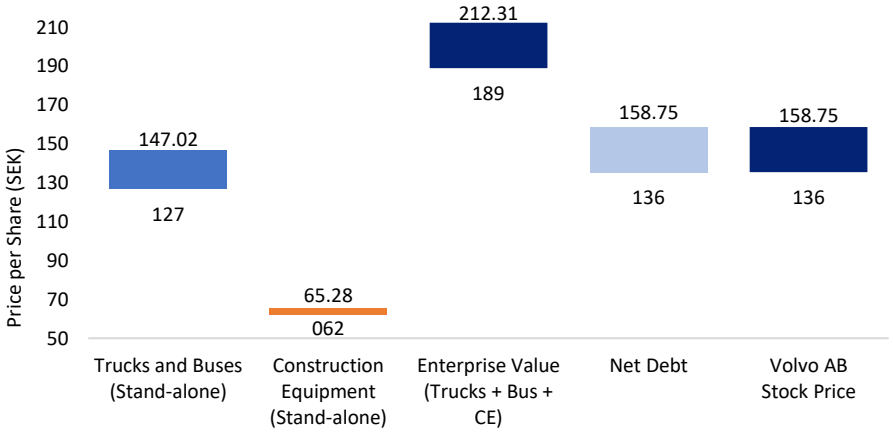


Figure 30 – Volvo AB Sum-of-the-Parts – EV/EBITDA Multiple.
(Source: Own computations)

8 Conclusion and Recommendations

After analyzing the current industry trends, the Volvo Group's challenges and opportunities, considering short and long-term macroeconomic outlooks for the different geographies the Volvo Group operates in, and taking into consideration the different valuation methodologies, the final recommendation is for investors to hold their positions as of the 31st December of 2020.

The multiples analysis confirmed that the price interval in which Volvo AB stock is traded is fairly assessed by the market. Additionally, the price computed through the DCF analysis, including the net cash payout to shareholders in 2020, allowed us to pin point with precision the value of the Volvo Group's stock to approximately SEK 162. Nonetheless, it is important to mention that the recommendation is closer to shifting to a sell rather than to a buy, as shown by the sensitivity analysis in the valuation chapter.

The Volvo Group is well established among its competitors, being able to enjoy outstanding efficiency levels and competitive advantages as it is recognized as a leader in the automotive industry at different levels, from the safety of its vehicles to the innovative solutions the Volvo Group integrates in its products. Nevertheless, the adverse short-medium term macroeconomic outlook, geopolitical issues as well as increasing competition in the industry might hurt the future performance of the company. Reputational risks arising from an emissions component and the cartel accusation may also damage the Volvo Group's credibility, increasing uncertainty on the company's future.

9 Appendix

Appendix 1 – Summary of Class of Shares Test. (Source: Yahoo Finance | Own computations)

SUMMARY OUTPUT - Classes of Share

Regression Statistics	
Multiple R	0.999994676
R Square	0.999989352
Adjusted R Square	0.99917169
Standard Error	0.382090542
Observations	1224

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	16767965.91	16767965.9	114854444.8	0
Residual	1223	178.5496621	0.14599318		
Total	1224	16768144.46			

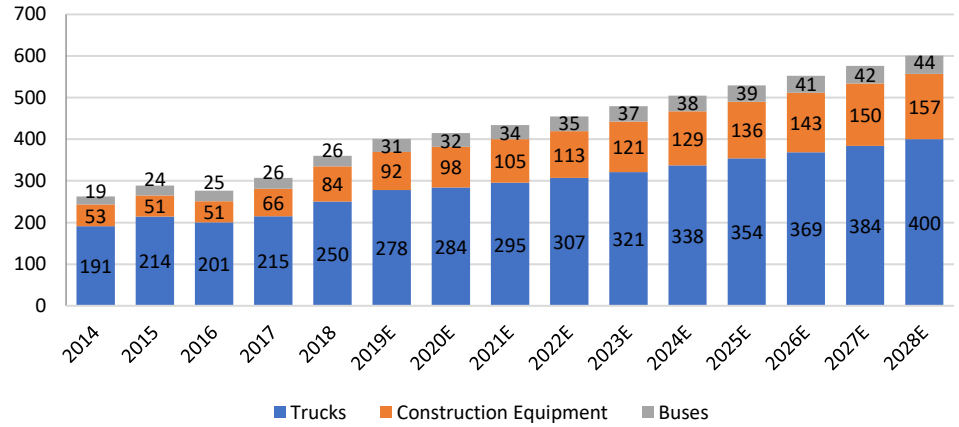
	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
X Variable 1	0.998752774	9.31932E-05	10717.0166	0	0.998569938	0.99893561	0.998569938	0.998935611

Appendix 2 – Year on Year Returns of Volvo, Peers and Indexes – 2014 to 2018. (Source: Bloomberg | Own Computations)

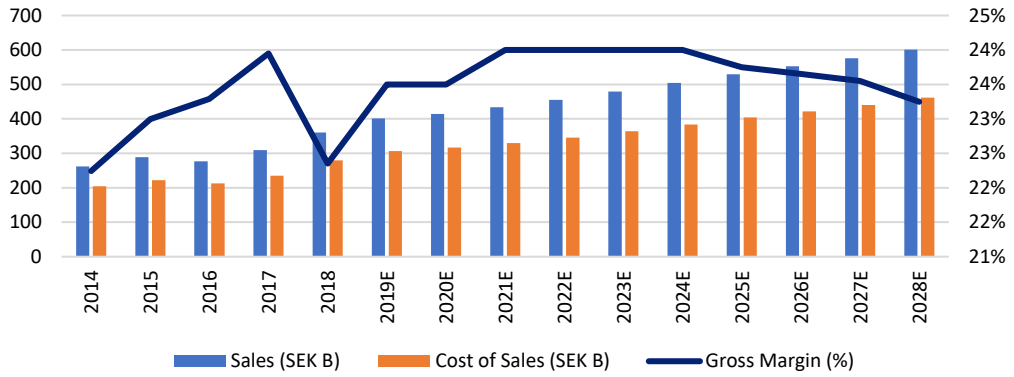
	2014	2015	2016	2017	2018	4Y CAGR
Volvo AB	**3%**	**-4%**	**39%**	**47%**	**-22%**	**11%**
MSCI World	25%	5%	13%	8%	-3%	6%
S&P500	-	8%	18%	7%	2%	9%
Paccar *	44%	-21%	49%	3%	-8%	3%
Tata Motors *	35%	78%	-37%	35%	-35%	0%
Man Se *	16%	4%	12%	9%	4%	7%
Daimler *	20%	13%	0%	8%	-29%	-3%
Hino Motors *	41%	31%	-27%	26%	1%	5%
Sany Heavy **	88%	-31%	-7%	43%	-3%	-3%
Hitachi **	29%	26%	-35%	31%	28%	8%
Komatsu **	-12%	30%	-16%	73%	23%	23%
Kubota **	-5%	62%	-2%	25%	-19%	13%
Caterpillar**	26%	-17%	53%	58%	-11%	16%
Deere & Co **	22%	8%	24%	43%	11%	21%

Appendix 3 - Volvo AB Capital Structure 2018. (Source: Volvo AB 2018 Annual Report | Own computations)

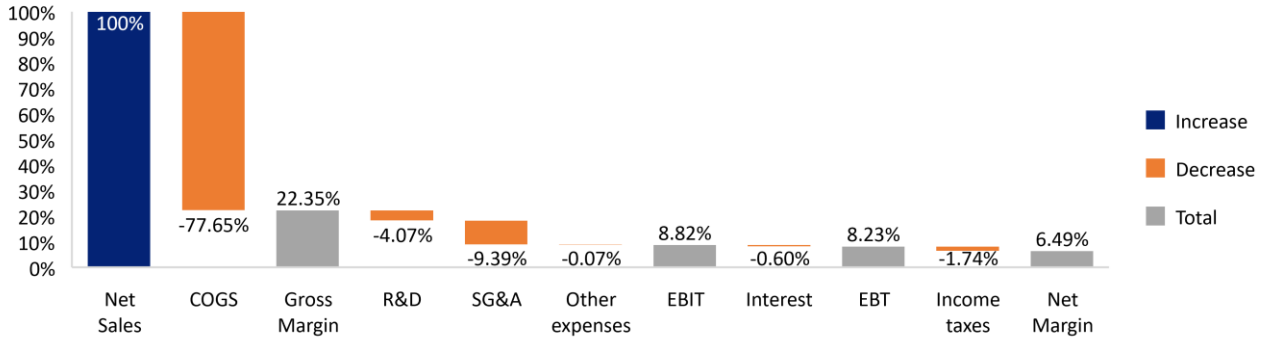
Appendix 4 - Net Sales by Segment (SEK B) from 2014 to 2028. (Own Computations)



Appendix 5 - Core Business: Net Sales, Cost of Sales and Gross Margin 2014-2028. (Source: Own computations)



Appendix 6 - Volvo AB Net Margin Breakdown 2018. (Source: Volvo AB 2018 Annual Report | Own Computations)



Appendix 7 - Summary Output: Volvo AB Beta 2019. (Source: Bloomberg | Own computations)

SUMMARY OUTPUT - MSCI World Index

Regression Statistics	
Multiple R	0.427032539
R Square	0.182356789
Adjusted R Square	0.181728799
Standard Error	0.015079672
Observations	1304

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.06603176	0.06603176	290.3815944	6.18965E-59
Residual	1302	0.29607025	0.000227397		
Total	1303	0.36210201			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	0.000317775	0.000418246	0.759780743	0.4475232	-0.00050273	0.001138284	-0.00050273	0.001138284
Beta	0.859583734	0.050443318	17.04058668	6.18965E-59	0.760624654	0.958542813	0.760624654	0.958542813

NOVA SCHOOL OF BUSINESS & ECONOMICS

Appendix 8 – Volvo AB Historical and Forecasted Income Statement 2014-2028. (Source: Volvo AB 2018 Annual Report | Own computations)

SEK M	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Core Revenues	262 404	288 566	276 767	309 055	360 422	401 008	414 549	434 199	455 076	479 135	504 787	529 749	552 425	576 209	601 181
Core Cost of Sales	-204 038	-222 210	-212 311	-235 041	-279 863	-306 771	-317 131	-329 991	-345 858	-364 143	-383 638	-403 934	-421 776	-440 512	-461 406
Core Gross Income	58 366	66 356	64 456	74 014	80 559	94 237	97 418	104 208	109 218	114 992	121 149	125 815	130 649	135 697	139 775
R&D expenses	-16 656	-15 368	-14 631	-16 098	-15 899	-17 588	-20 598	-21 574	-22 612	-23 807	-25 082	-26 322	-27 449	-28 631	-29 871
Core SG&A Expenses	-30 470	-30 899	-29 324	-31 597	-33 833	-35 069	-40 368	-42 281	-44 314	-46 657	-49 155	-51 586	-53 794	-56 110	-58 542
Damages and litigations	-4 420	471	-2 912	-234	-687	-841	-702	-897	-561	-616	-723	-700	- 700	-660	-680
Core Restructuring costs	-2 384	-2 166	-421	-24	-26	0	0	0	0	0	0	0	0	0	0
Income from investments in joint ventures and associated companies	46	-143	156	1 407	1 948	1 504	1 805	2 166	2 491	2 615	2 694	2 774	2 858	2 943	3 032
Core EBIT	**4 482**	**18 251**	**17 323**	**27 468**	**32 061**	**42 243**	**37 555**	**41 620**	**44 221**	**46 527**	**48 882**	**49 982**	**51 564**	**53 240**	**53 713**
Core Taxes	2 721	4 843	5 589	6 798	6 766	10 751	9 542	9 871	10 577	11 456	11 935	12 080	12 520	12 976	13 057
Core Result	**1 761**	**13 408**	**11 735**	**20 669**	**25 295**	**31 493**	**28 014**	**31 749**	**33 644**	**35 071**	**36 947**	**37 902**	**39 043**	**40 264**	**40 656**
Non-core Revenues	20 545	23 950	25 147	25 693	30 413	25 868	29 252	30 240	31 673	33 196	34 951	36 822	38 643	40 297	42 032
Non-core Result before taxes	**2 600**	**4 533**	**3 754**	**2 637**	**1 746**	**4 291**	**4 436**	**4 647**	**4 870**	**5 127**	**5 402**	**5 669**	**5 912**	**6 166**	**6 433**
Non-core Taxes	572	997	826	580	384	918	932	957	1 003	1 056	1 113	1 168	1 218	1 270	1 325
Non-core Result	**2 028**	**3 536**	**2 928**	**2 057**	**1 361**	**3 373**	**3 505**	**3 689**	**3 867**	**4 071**	**4 289**	**4 501**	**4 694**	**4 896**	**5 108**
Operational Result	**3 789**	**16 943**	**14 663**	**22 727**	**26 656**	**34 866**	**31 518**	**35 439**	**37 511**	**39 142**	**41 236**	**42 403**	**43 737**	**45 160**	**45 764**
Interest expenses and similar charges	-1 994	-2 366	-1 847	-1 852	-1 658	-1 850	-2 178	-2 233	-2 289	-2 347	-2 406	-2 467	-2 529	-2 593	-2 658
Financial Result before taxes and OCI	**-1 994**	**-2 366**	**-1 847**	**-1 852**	**-1 658**	**-1 850**	**-2 178**	**-2 233**	**-2 289**	**-2 347**	**-2 406**	**-2 467**	**-2 529**	**-2 593**	**-2 658**
Tax Shield	**-439**	**-521**	**-406**	**-407**	**-365**	**-396**	**-457**	**-460**	**-472**	**-484**	**-496**	**-508**	**-521**	**-534**	**-548**
Other comprehensive income (net of taxes)	**6 487**	**-3 498**	**5 147**	**-3 434**	**1 691**	**1 987**	**1 008**	**2 109**	**1 168**	**2 322**	**1 984**	**1 974**	**2 202**	**2 196**	**2 441**
Financial Result	**4 932**	**-5 343**	**3 706**	**-4 879**	**398**	**533**	**-713**	**336**	**-650**	**458**	**74**	**15**	**193**	**137**	**330**
Total comprehensive income for the period	**8 722**	**11 601**	**18 370**	**17 849**	**27 054**	**35 399**	**30 806**	**35 775**	**36 861**	**39 600**	**41 310**	**42 418**	**43 931**	**45 297**	**46 094**

Appendix 9 - Volvo AB Historical and Forecasted Changes to Share Equity Statement 2015-2028. (Source: Volvo AB 2018 Annual Report | Own computations)

SEK M	2015	2016	2017	2018	2019 E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Beginning Equity (adjusted to IFRS 15)	**78 325**	**83 810**	**95 349**	**105 490**	**123 379**	**145 754**	**161 166**	**179 061**	**197 501**	**217 309**	**237 973**	**259 191**	**276 772**	**294 899**
Total Comprehensive Income	11 525	18 249	17 103	26 536	42 667	30 806	35 775	36 861	39 600	41 310	42 418	43 931	45 297	46 094
Dividends	-6 090	-6 093	-6 603	-8 636	-20 300	-15 403	-17 887	-18 431	-19 800	-20 655	-21 209	-26 358	-27 178	-34 570
% of Total Comprehensive income or Payout Ratio	-52.84%	-33.39%	-38.61%	-32.54%	-44.16%	-50.00%	-50.00%	-50.00%	-50.00%	-50.00%	-50.00%	-60.00%	-60.00%	-75.00%
Dividend growth rate		0.05%	8.37%	30.79%	135.06%	-24.12%	16.13%	3.04%	7.43%	4.32%	2.68%	24.28%	3.11%	27.20%
Shares Issues and Others	48	95	11	-11	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Net Payout to Shareholders	-6 042	-5 998	-6 592	-8 647	-20 291	-15 394	-17 879	-18 422	-19 792	-20 646	-21 201	-26 350	-27 170	-34 562
Ending Equity (without adjustment)	**83 808**	**96 061**	**105 860**	**123 379**	**145 754**	**161 166**	**179 061**	**197 501**	**217 309**	**237 973**	**259 191**	**276 772**	**294 899**	**306 431**

Appendix 10 - Volvo AB Historical and Forecasted Cash Flows Statement 2014-2028. (Source: Volvo AB 2018 Annual Report | Own computations)

SEK M	2014	2015	2016	2017	2018	2019E	2020	2021	2022	2023	2024	2025	2026	2027	2028
Core result	1 761	13 408	11 735	20 669	25 295	31 493	28 014	31 749	33 644	35 071	36 947	37 902	39 043	40 264	40 656
Core Invested Capital	196 882	194 764	208 989	195 444	219 363	249 615	263 100	275 228	282 303	295 241	303 701	310 959	321 959	326 728	330 988
Change in Core Invested Capital		-2 118	14 226	-13 545	23 918	30 253	13 484	12 128	7 075	12 938	8 460	7 258	11 000	4 769	4 260
FCF Core Business		**15 526**	**-2 491**	**34 215**	**1 376**	**1 240**	**14 529**	**19 621**	**26 569**	**22 133**	**28 487**	**30 644**	**28 043**	**35 495**	**36 395**
Non core result	2 028	3 536	2 928	2 057	1 361	3 373	3 505	3 689	3 867	4 071	4 289	4 501	4 694	4 896	5 108
Non core Invested Capital	10 567	8 657	11 199	10 264	9 418	8 064	8 426	8 804	9 199	9 611	10 043	10 493	10 964	11 456	11 970
Change in Non core Invested Capital		-1 910	2 541	- 935	- 846	-1 354	362	378	395	413	431	451	471	492	514
FCF Non-core Business		**5 445**	**387**	**2 992**	**2 207**	**4 727**	**3 143**	**3 311**	**3 472**	**3 658**	**3 858**	**4 051**	**4 223**	**4 404**	**4 594**
FCF Operational		**16 943**	**14 663**	**22 727**	**26 656**	**34 866**	**31 518**	**35 439**	**37 511**	**39 142**	**41 236**	**42 403**	**43 737**	**45 160**	**45 764**
FCF Investment		**-4 028**	**16 767**	**-14 480**	**23 073**	**28 899**	**13 846**	**12 506**	**7 470**	**13 350**	**8 891**	**7 708**	**11 471**	**5 261**	**4 774**
Free CF		**20 971**	**-2 104**	**37 207**	**3 584**	**5 967**	**17 672**	**22 932**	**30 041**	**25 792**	**32 345**	**34 695**	**32 266**	**39 899**	**40 990**
Financial Result	4 932	-5 343	3 706	-4 879	398	533	- 713	336	- 650	458	74	15	193	137	330
Net Debt	127 401	117 809	123 137	98 278	102 949	108 880	107 284	101 864	90 864	84 374	72 571	59 029	52 886	39 988	33 197
Change in Net Debt		-9 592	5 328	-24 859	4 671	5 931	-1 596	-5 420	-11 000	-6 490	-11 804	-13 542	-6 142	-12 899	-6 791
Equity	80 048	85 611	97 052	107 431	125 831	148 799	164 241	182 168	200 638	220 478	241 173	262 423	280 036	298 196	309 762
Change in Equity		5 563	11 441	10 379	18 400	22 968	15 442	17 927	18 470	19 840	20 695	21 250	17 613	18 160	11 565
Comprehensive Income	8 722	11 601	18 370	17 849	27 054	35 399	30 806	35 775	36 861	39 600	41 310	42 418	43 931	45 297	46 094
FCF Financial		**-20 973**	**2 105**	**-37 208**	**-3 586**	**-5 966**	**-17 672**	**-22 932**	**-30 041**	**-25 792**	**-32 345**	**-34 695**	**-32 266**	**-39 899**	**-40 990**

Appendix 11 - Volvo AB Historical and Forecasted Balance Sheet 2014-2028. (Source: Volvo AB 2018 Annual Report | Own computations)

SEK M	2014	2015	2016	2017	2018	2019E	2020E	2021E	2022E	2023E	2024E	2025E	2026E	2027E	2028E
Core Intangible Assets	34 420	33 625	34 758	33 138	35 139	38 615	39 773	40 966	42 195	43 461	44 765	46 108	47 491	48 916	50 383
Core PP&E	51 174	49 509	51 221	49 253	57 067	59 999	63 333	68 340	72 385	76 822	81 721	87 101	92 547	98 410	104 696
Assets under operating leases	30 318	31 504	37 355	40 071	41 520	56 231	62 182	69 472	72 812	81 453	85 814	90 057	99 437	103 718	108 213
Investments in Joint Ventures and associated companies	4 821	11 148	11 643	10 525	11 135	12 834	13 348	13 882	14 437	15 014	15 615	16 240	16 889	17 565	18 267
Core Non-current customer-financing receivables	49 851	49 353	55 831	54 942	63 719	73 569	79 890	83 677	87 700	92 336	97 280	102 091	106 460	111 044	115 856
Core Deferred tax assets	14 682	12 419	13 378	11 099	12 454	12 434	12 437	12 248	12 478	12 483	12 416	12 412	12 407	12 439	12 432
Core Inventories	44 220	42 989	46 621	50 872	63 367	62 807	64 928	67 561	70 810	74 553	78 545	82 700	86 353	90 189	94 467
Core Customer-financing receivables	46 457	49 991	51 165	50 254	58 547	68 989	74 619	78 156	81 914	86 244	90 862	95 355	99 437	103 718	108 213
Core Tax assets	3 166	1 995	1 246	1 447	1 539	2 082	1 902	1 886	1 993	2 084	2 174	2 020	2 010	2 028	2 051
Core Accounts receivable	30 004	28 182	31 260	36 838	40 367	42 569	44 006	46 092	48 309	50 863	53 586	56 236	58 643	61 167	63 818
Core Other Receivable (current)	7 335	6 960	8 740	7 529	7 572	7 857	7 944	8 108	8 003	8 082	8 167	8 027	8 055	8 073	8 068
Operational cash	5 659	6 250	6 038	6 695	7 817	8 697	8 991	9 417	9 870	10 391	10 948	11 489	11 981	12 497	13 038
Core Provisions for deferred taxes (Non current)	2 593	3 227	4 832	4 723	3 807	3 836	3 929	4 046	3 915	3 780	3 901	3 914	3 911	3 884	3 878
Core Other Liabilities (current and non-current)	50 972	57 524	70 705	77 997	86 948	95 287	104 426	114 441	125 417	137 445	150 627	165 074	180 906	198 256	217 270
Other provisions (Non Current)	8 313	6 357	6 055	5 656	9 647	9 677	10 004	10 478	10 982	11 562	12 181	12 784	13 331	13 905	14 507
Current provisions	8 315	9 451	7 385	6 944	8 849	11 079	11 453	11 996	12 573	13 238	13 946	14 636	15 262	15 920	16 610
Core Trade payables	52 534	51 383	50 661	60 330	67 901	75 259	77 800	80 955	84 848	89 333	94 116	99 095	103 473	108 069	113 195
Core Tax liabilities	2 497	1 221	628	1 569	3 729	1 929	2 641	2 661	2 867	3 187	3 418	3 374	2 868	3 002	3 054
Core Invested Capital	**196 882**	**194 764**	**208 989**	**195 444**	**219 363**	**249 615**	**263 100**	**275 228**	**282 303**	**295 241**	**303 701**	**310 959**	**321 959**	**326 728**	**330 988**
Non-Core Invested Capital	**10 567**	**8 657**	**11 199**	**10 264**	**9 418**	**8 064**	**8 426**	**8 804**	**9 199**	**9 611**	**10 043**	**10 493**	**10 964**	**11 456**	**11 970**
Total Invested Capital	**207 449**	**203 421**	**220 188**	**205 708**	**228 781**	**257 679**	**271 526**	**284 032**	**291 502**	**304 852**	**313 744**	**321 452**	**332 923**	**338 184**	**342 958**
Long Term Loans	108 031	75 276	84 551	73 904	91 894										
Short Term Loans	39 953	57 331	56 497	53 771	50 171										
Total Debt	**147 984**	**132 607**	**141 048**	**127 675**	**142 065**	**167 272**	**171 491**	**175 816**	**180 251**	**184 797**	**189 458**	**194 236**	**199 135**	**204 158**	**209 307**
Excess cash	20 583	14 798	17 911	29 397	39 116	58 392	64 207	73 952	89 387	100 422	116 887	135 207	146 249	164 170	176 110
Net Debt	**127 401**	**117 809**	**123 137**	**98 278**	**102 949**	**108 880**	**107 284**	**101 864**	**90 864**	**84 374**	**72 571**	**59 029**	**52 886**	**39 988**	**33 197**
Equity attributable to the equity holders of the parent company	**78 325**	**83 810**	**95 349**	**105 490**	**123 379**	**145 754**	**161 166**	**179 061**	**197 501**	**217 309**	**237 973**	**259 191**	**276 772**	**294 899**	**306 431**
Minority interests	**1 723**	**1 801**	**1 703**	**1 941**	**2 452**	**3 045**	**3 076**	**3 106**	**3 137**	**3 169**	**3 200**	**3 232**	**3 265**	**3 297**	**3 330**

10 References

American Bus Association (ABA). (2018). *American Bus Association (ABA)*. Retrieved from Motorcoach Economic Impact Study: https://www.buses.org/aba-foundation/research-summary/economic-impact/motorcoach-economic-impact-study

American Trucking Associations (ATA). (2019). *American Trucking Associations (ATA)*. Retrieved from Reports, Trends & Statistics: https://www.trucking.org/News_and_Information_Reports_Industry_Data.aspx

European Automobile Manufacturers Association (ACEA). (2019). *European Automobile Manufacturers Association (ACEA)*. Retrieved from Trucks, Vans and Buses: https://www.acea.be/automobile-industry/trucks-vans-buses

IMF. (2019). *Global Financial Stability Report: Lower for Longer.* Washington, DC: International Monetary Fund. Retrieved from https://www.imf.org/en/Publications/GFSR/Issues/2019/10/01/global-financial-stability-report-october-2019#FullReport

IMF. (2019). *World Economic Outlook, October 2019: Global Manufacturing Downturn, Rising Trade Barriers.* Washington DC: International Monetary Fund. Retrieved from https://www.imf.org/en/Publications/WEO/Issues/2019/10/01/world-economic-outlook-october-2019

Imode, J., & Okur, M. (2019). Europe Industrials: Industry Outlook. *Bloomberg Intelligence*.

Koller, T., Goedhart, M., Wessels, D., & McKinsey & Company. (2010). *Valuation Measuring and Managing the Value of Companies* (5th ed.). United States of America: John Wiley & Sons. Retrieved from http://elibrary.bsu.az/books_200/N_1.pdf

Kovatchev, S. (2019). Volvo Trucks: Valuation. *Bloomberg Intelligence*.

Mohr, D., Müller, N., Krieg, A., Gao, P., Kaas, H.-W., Krieger, A., & Hensley, R. (2013). *The road to 2020 and beyond: What's driving the global automotive industry? - Advanced Industries.* McKinsey & Company, Inc.

Moody's. (2018). *Annual Default Study: Corporate Default and Recovery Rates, 1920-2017.* Moody's Investors Service.

OECD. (2018). *Organisation for Economic Co-operation and Development (OECD)*. Retrieved from GDP long-term forecast: https://data.oecd.org/gdp/gdp-long-term-forecast.htm

Ortiz, A. (2019). *Bloomberg Intelligence Volvo Litigation Research.* Bloomberg.

Roland Berger GmbH. (2018). *Trends in the truck & Trailer Industry - Market Study .* Munich: Roland Berger GmbH.

Schiller , D., Maier, M., & Büchle, M. (2017). *Global Truck Study 2016 - The Truck Industry in Transition.* Deloitte. Retrieved from https://www2.deloitte.com/content/dam/Deloitte/us/Documents/manufacturing/us-manufacturing-global-truck-study-the-truck-industry-in-transition.pdf

Statista. (2018). *U.S. car manufacturers.*

UNCTAD. (2019). *Trade and Development Report 2019 – Financing a Global Green New Deal.* Geneva: United Nations Conference on Trade and Development (UNCTAD). Retrieved from https://unctad.org/en/pages/PublicationWebflyer.aspx?publicationid=2526

Volvo Group. (2019). Retrieved from Volvo Group: https://www.volvogroup.com/

Woof, M., Arminas, D., Woodford, G., & Saez, E. (2019). *Global Report - Construction Equipment 2019.* Kent: Route One Publishing Ltd.

Thomson Reuters, Bloomberg Terminal and Yahoo Finance Data

General information of the Volvo Group was retrieved from: https://www.volvogroup.com/en-en/about-us.html

Volvo Group's financial statements (2014 to 2019) were retrieved from the Annual Reports (available on: https://www.volvogroup.com/en-en/investors/reports-and-presentations/annual-reports.html)

11 Disclosures and Disclaimers

Report Recommendations

Buy	Expected total return (including expected capital gains and expected dividend yield) of more than 10% over a 12-month period.
Hold	Expected total return (including expected capital gains and expected dividend yield) between 0% and 10% over a 12-month period.
Sell	Expected negative total return (including expected capital gains and expected dividend yield) over a 12-month period.

This report was prepared by Miguel Lopes Martins and João Nunes de Carvalho, Master in Finance students of Nova School of Business and Economics ("Nova SBE"), within the context of the Field Lab – Equity Research.

This report is issued and published exclusively for academic purposes, namely for academic evaluation and master graduation purposes, within the context of said Field Lab – Equity Research. It is not to be construed as an offer or a solicitation of an offer to buy or sell any security or financial instrument.

This report was supervised by a Nova SBE faculty member, acting merely in an academic capacity, who revised the valuation methodology and the financial model.

Given the exclusive academic purpose of the reports produced by Nova SBE students, it is Nova SBE understanding that Nova SBE, the author, the present report and its publishing, are excluded from the persons and activities requiring previous registration from local regulatory authorities. As such, Nova SBE, its faculty and the author of this report have not sought or obtained registration with or certification as financial analyst by any local regulator, in any jurisdiction. In Portugal, neither the author of this report nor his/her academic supervisor is registered with or qualified under COMISSÃO DO MERCADO DE VALORES MOBILIÁRIOS ("CMVM", the Portuguese Securities Market Authority) as a financial analyst. No approval for publication or distribution of this report was required and/or obtained from any local authority, given the exclusive academic nature of the report.

The additional disclaimers also apply:

USA: Pursuant to Section 202 (a) (11) of the Investment Advisers Act of 1940, neither Nova SBE nor the author of this report are to be qualified as an investment adviser and, thus, registration with the Securities and Exchange Commission ("SEC", United States of America's securities market authority) is not necessary. Neither the author nor Nova SBE receive any compensation of any kind for the preparation of the reports.

Germany: Pursuant to §34c of the WpHG (*Wertpapierhandelsgesetz*, i.e., the German Securities Trading Act), this entity is not required to register with or otherwise notify the *Bundesanstalt für Finanzdienstleistungsaufsicht* ("BaFin", the German Federal Financial Supervisory Authority). It should be

noted that Nova SBE is a fully-owned state university and there is no relation between the student's equity reports and any fund raising programme.

UK: Pursuant to section 22 of the Financial Services and Markets Act 2000 (the "FSMA"), for an activity to be a regulated activity, it must be carried on "by way of business". All regulated activities are subject to prior authorization by the Financial Conduct Authority ("FCA"). However, this report serves an exclusively academic purpose and, as such, was not prepared by way of business. The author - a Master's student - is the **sole and exclusive responsible** for the information, estimates and forecasts contained herein, and for the opinions expressed, which exclusively reflect his/her own judgment at the date of the report. Nova SBE and its faculty have no single and formal position in relation to the most appropriate valuation method, estimates or projections used in the report and may not be held liable by the author's choice of the latter.

The information contained in this report was compiled by students from public sources believed to be reliable, but Nova SBE, its faculty, or the students make no representation that it is accurate or complete, and accept no liability whatsoever for any direct or indirect loss resulting from the use of this report or of its content.

Students are free to choose the target companies of the reports. Therefore, Nova SBE may start covering and/or suspend the coverage of any listed company, at any time, without prior notice. The students or Nova SBE are not responsible for updating this report, and the opinions and recommendations expressed herein may change without further notice.

The target company or security of this report may be simultaneously covered by more than one student. Because each student is free to choose the valuation method, and make his/her own assumptions and estimates, the resulting projections, price target and recommendations may differ widely, even when referring to the same security. Moreover, changing market conditions and/or changing subjective opinions may lead to significantly different valuation results. Other students' opinions, estimates, and recommendations, as well as the advisor and other faculty members' opinions may be inconsistent with the views expressed in this report. Any recipient of this report should understand that statements regarding future prospects and performance are, by nature, subjective, and may be fallible.

This report does not necessarily mention and/or analyze all possible risks arising from the investment in the target company and/or security, namely the possible exchange rate risk resulting from the security being denominated in a currency either than the investor's currency, among many other risks.

The purpose of publishing this report is merely academic and it is not intended for distribution among private investors. The information and opinions expressed in this report are not intended to be available to any person other than Portuguese natural or legal persons or persons domiciled in Portugal. While preparing this report, students did not have in consideration the specific investment objectives, financial situation or particular needs of any specific person. Investors should seek financial advice regarding the appropriateness of investing in any security, namely in the security covered by this report.

The author hereby certifies that the views expressed in this report accurately reflect his/her personal opinion about the target company and its securities. He/ She has not received or been promised any direct or indirect compensation for expressing the opinions or recommendation included in this report.

The content of each report has been shown or made public to restricted parties prior to its publication in Nova SBE's website or in Bloomberg Professional, for academic purposes such as its distribution among faculty members for students' academic evaluation.

Nova SBE is a state-owned university, mainly financed by state subsidies, students tuition fees and companies, through donations, or indirectly by hiring educational programs, among other possibilities. Thus, Nova SBE may have received compensation from the target company during the last 12 months, related to its fundraising programs, or indirectly through the sale of educational, consulting or research services. Nevertheless, no compensation eventually received by Nova SBE is in any way related to or dependent on the opinions expressed in this report. The Nova School of Business and Economics does not deal for or otherwise offer any investment or intermediation services to market counterparties, private or intermediate customers.

A Work Project presented as part of the requirements for the Award of a Master Degree in Finance from the NOVA – School of Business and Economics.

EQUITY RESEARCH – VOLVO AB

THE IMPACT OF CORPORATE GOVERNANCE IN THE VALUATION

JOÃO NUNES DE CARVALHO

A Project carried out on the Master in Finance Program, under the supervision of:

Professor Filipa Castro

Professor Francisco Martins

Professor Nuno Vasconcellos e Sá

Professor Rosário André

January 3rd, 2020

Abstract:

This report was made in the context of an Equity Research on Volvo AB, as part of the requirements for the Award of a master's degree in Finance from Nova School of Business and Economics. The reader will find about the importance of corporate governance in a valuation, followed by an analysis of the different corporate governance aspects of the Volvo Group.

Keywords: Volvo AB, Valuation, Equity Research, Investment, Corporate Governance

This work used infrastructure and resources funded by Fundação para a Ciência e a Tecnologia (UID/ECO/00124/2013, UID/ECO/00124/2019 and Social Sciences DataLab, Project 22209), POR Lisboa (LISBOA-01-0145-FEDER-007722 and Social Sciences DataLab, Project 22209) and POR Norte (Social Sciences DataLab, Project 22209).

The Impacts of Corporate Governance in a Valuation: Volvo AB

What is Corporate Governance and how it affects a Valuation

When one thinks about attributing a quantitative value to a company, it is highly likely that corporate governance is a subject which will not come to mind. Immediately, we think about concrete and measurable variables. While corporate governance is not a measurable attribute, it most definitely cannot be ignored when performing the valuation of a company. In this report, we will address the reasons why corporate governance is a significant matter in valuation, followed by an analysis of the corporate governance of the Volvo Group to infer if there are any matters which could potentially have an impact in the company's future.

Corporate Governance is a system of rules, controls, practices and checks by which companies are directed and managed, and the interests of a company's different stakeholders are balanced. It is a framework which defines the rights, roles and responsibilities of management, board and shareholders, and exists due to the Principal-Agent problem arising from the differences in both the goals and the information available to shareholders (principal) and management (agent). Good corporate governance is successful in both aligning the interests of the different stakeholders of the company and monitoring the management team.

The board of directors plays a pivotal role in defining the strategy of a company, and they can deeply influence they way a business is managed. For example, by choosing to have the management team receive share-based compensation, the interests of management are better aligned with those of shareholders. By doing so, management has an incentive to perform well and to have long-term oriented goals, deterring the likelihood that management will undertake risky projects or put the company's future in jeopardy. Corporate Governance also dictates the roles of the different parties of a company, and if, for example, it effectively segregates functions in a company through different bodies or committees, it makes it harder for fraud to go unnoticed.

Another key qualitative attribute which is conveyed by corporate governance is trust. Markets realize that inexistence, non-communication or poor corporate governance practices may be a cause for alarm with all stakeholders, and if the integrity and transparency of the company is questionable, then it may end up affecting its financials. Today, we can observe that most traded companies divulge information related to their corporate governance, in many cases not due to regulatory or binding legislation, but because we are witnessing an increase in general public awareness to issues related to corporate governance

Several published researches[1] suggest that, on average, having good corporate governance, results in higher credit ratings and a lower cost of debt. This is due to the impact on the overall default risk of the firm, which is perceived to be smaller in the presence of good corporate governance practices that help reduce default risk by mitigating agency costs and reducing information asymmetry between the firm and the lenders.

Corporate Governance in Volvo AB: An Overview

Volvo AB is a listed company and their shares are traded in Nasdaq Stockholm, and as such the company is subject to the Swedish Code of Corporate Governance. The Swedish Code of Corporate Governance promotes self-regulation, allowing a great deal of flexibility for companies to decide how they want to implement these rules, provided that any deviations are duly addressed and explained by the company. Furthermore, the Swedish Corporate Governance Board is a body that analyzes and monitors companies which are subject to the Code. The annual corporate governance report is also reviewed by the external auditors of the group.

[1]The effect of corporate governance on firm's credit ratings: further evidence using governance score in the United States; Fatima Alali , Asokan Anandarajan , Wei Jiang; California State University – Fullerton, Fullerton, CA 92834, USA School of Management, New Jersey Institute of Technology, University Heights, Newark, NJ 07102, USA

Effect of Corporate Governance on Bond Ratings and Yields: The Role of Institutional Investors and Outside Directors; Sanjeev Bhojraj from Cornell University and Partha Sengupta from University of Maryland

Other than abiding by legal or regulatory requirements, the Volvo Group also discloses further information on their practices, like their Code of Conduct, Remuneration Policy, Quality Policy, Safety Policy and Environmental Policy. This effective communication of their corporate governance practices effectively increases investors' trust in the company and leads to increased brand recognition. The Volvo Group also discloses their effective organizational charts at governance and management level, along with respective duties, qualifications and remuneration.

Corporate Governance in Volvo AB: Key Factors to Consider

One of the most important bodies of governance is the Election Committee, which is appointed by the Annual General Meeting of Volvo AB. Every year, the Annual General Meeting elects five members to serve on the Election Committee, of whom four shall represent the largest shareholders in the company. In addition, one of the members shall be the Chairman of the Volvo Group, a position which is currently held of Mr. Carl-Henrik Svanberg. This committee submits proposals to the Annual General Meeting concerning the election of Board members and Board Chairman as well as proposals for resolutions concerning remuneration of the Board.

Regarding the external auditor of the Volvo Group, in 2018 the company changed their external auditor from *PricewaterhouseCoopers AB* to *Delloite AB*. The newly contracted public accounting firm has been appointed to be the Volvo Group's auditor until 2022. External auditors play a key role in ensuring that the financial statements are reliable and provide a fair representation of the company being audited. For the external auditor to do his job, he must act with independence, integrity and objectivity, not allowing oneself to be influenced[2], and in that sense auditor rotation is fundamental to ensure the independence of the external auditors. There is external audit firm rotation, when a company changes their external audit firm, and audit partner rotation, which means the signing Certified Official Auditor must change periodically, although it

[2]International Standard on Auditing (ISA) 200, 2018, International Auditing and Assurance Standards Board

can be another partner from the same firm. While there is no consensus on this subject, the fact that Volvo Group changed their external auditor effectively adds more trust to the Volvo Group's financial statements

Moving on to that which is the most important body in terms of corporate governance, the Board of Directors is composed by 15 members. Concerning the independence of board members, only one person from the management team may be in the board of directors, in that regard Mr. Martin Lundstedt has been both the president and CEO of Volvo Group since October 2015. Furthermore, a majority of the board must be independent from the company and its management. There are three committees within the board of directors: the Audit Committee, the Remuneration Committee and the Business Area Committee.

The Remuneration Committee has the purpose of preparing proposals in terms of the remuneration of senior executives of Volvo Group, from base salary to incentives and pensions. We find that the company seizes this opportunity to align interests, as its incentives packages are comprised of short-term (cash) and long-term incentives (shares of the company). The Audit Committee has the purpose of supervising the accounting and financial reporting processes, being involved in both the internal controls and the audit of the financial statements. It is composed by 3 members, of which at least 2 must be independent from the company and its management team, and additionally 1 of the 2 independent members must also be independent from the company's major shareholders. The company also has an Internal Audit and an Internal Control function, both of which report to the Audit Committee. The Business Area Committee is responsible for reviewing and evaluating the development of the many different business areas of the Volvo group.

Regarding the management team, as mentioned earlier the president of the Volvo Group also serves as CEO. Although there are critics of this role duality, arguments can be made both for and against it, and at the end of the day there really is no consensus on this matter. Take for example

the case of Amazon, the company CEO also serves as its president and Amazon is one of the most successful companies worldwide. The CEO and the rest of the executive board make up the highest operational decision body in Volvo Group.

Despite having a balanced representation of men and women in its executive board and board of directors, there is not much ethnical diversity in these bodies. Inclusiveness in high profile jobs is a process to which public awareness was only raised in recent years, and as such the composition of these bodies does not raise any red flags in that regard. In our analysis we also found that the Volvo Group does not have a dedicated Compliance Committee.

Conclusions

As initially stated, Corporate Governance is an important factor to consider when performing the valuation of a company. This is due to the multitude of implications it has on a company and in its value to investors. Corporate Governance impacts a company in terms of its strategy, its operations and in the relationships with stakeholders. In our analysis, we found no significant issues which compromise the reliability of the company's financial statements, or that indicate any governance malpractices. The company has taken additional steps to prevent, detect, and address potential issues, for instance with the implementation of a whistleblower tool which makes it easier to reveal any issues, and periodic reports are issued compiling those matters. The facts gathered further boost our confidence that the annual report provides a truthful representation of the Volvo Group, and as such the information in it can be used as a basis for this equity research. We also found no corporate governance issues that might affect the company in the future.